

## **LISTING OF THE CLAIMS**

**This listing of claims will replace all prior versions, and listings, of claims in the application:**

1. (currently amended) An electromagnetic field stimulator device for Anatomic Biophysical Chondroprotection, comprising:

~~in which~~ means of current generation ~~are suitable~~ for powering at least one solenoid to generate an electromagnetic field directed on a part of the human body including cartilaginous tissue,

~~wherein characterized in that~~ the said means of current generation supplies said solenoid with current ( $i(t)$ ) having a waveform that includes the repetition of a linear ramp with a certain slope; said current ( $i(t)$ ) causing the generation of an electromagnetic field that induces on a control probe irradiated by said electromagnetic field, a voltage ( $V_{in}$ ) of markedly constant amplitude during the ramp-like linear growth period of said current ( $i(t)$ ).

2. (currently amended) A device according to claim 1, ~~wherein in which~~ said means of current generation ~~include includes~~ at least one table in which at least one function ( $f(t)$ ) is stored that provides, for each value of a scanning signal in input ( $sc$ ), an output value that expresses a target current intensity ( $I_{out}$ ), the said function  $f(t)$  being a linear one and representing a ramp with a certain slope that supplies, for increasing values of said scanning signal in input ( $sc$ ), linearly increasing values of said target current intensity ( $I_{out}$ ).

3. (currently amended) A device according to claim 2, ~~wherein in which~~ said table includes a plurality ~~contains a number~~ of functions ( $f(t)$ ) of different, selectable types.

4. (currently amended) A device according to claim 2, further comprising in which timer devices ~~are provided that are~~ suitable for generating said scanning signal in input ( $sc$ ).

5. (currently amended) A device according to claim 2, further comprising in which attenuator devices having ~~are provided with~~ their input communicating with the output of said

table, said attenuator devices being suitable for reducing the value of said target current intensity ( $I_{out}$ ) in function of a programmable parameter (IPK) to limit the maximum value of said current ( $i(t)$ ) feeding said solenoid.

6. (currently amended) A device according to claim 1, further comprising in which a feedback system for is provided that performs continuous monitoring of said current ( $i(t)$ ) present in said solenoid, and comparing a measured current value ( $I_{mis}$ ) with a reference value ( $I_{out}$ );  
wherein in cases of variances between ~~the two~~ said measured current and reference values, due to changes in impedance of said solenoid, said feedback system automatically ~~takes care of adjusting~~ adjusts the value of said current ( $i(t)$ ) feeding said solenoid in order to maintain the waveform of said induced voltage ( $V_{in}$ ) unaltered.

7. (currently amended) A device according to claim 6, wherein in which said feedback system includes:  
detector devices suitable for supplying said measured current value ( $I_{mis}$ ), and  
subtraction devices suitable for generating an error signal in function of said measured current value ( $I_{mis}$ ) and of said reference value ( $I_{out}$ ).

8. (currently amended) A device according to claim 7, wherein in which a generator circuit is provided that receives said error signal in input and generates an alternating analogue power signal ( $S(t)$ ) having a fixed frequency and variable duty cycle in function of said error signal, said variable duty cycle being suitable for regulating the intensity of said current ( $i(t)$ ).

9. (currently amended) A device according to claim 8, wherein in which said generator circuit includes a pulse width modulator.

10. (currently amended) A device according to claim 8, further comprising in which low-pass filter devices ~~are provided~~ between the output of said generator circuit and the said solenoid.

11. (currently amended) A device according to claim 1, ~~wherein-in which~~ said solenoid is made from a plurality number of sheets of a flexible material to ~~be adapted~~ adapt itself to the shape of said portion of the human body.

12. (currently amended) A method for Anatomic Biophysical Chondroprotection, comprising the ~~steps~~ phases of:

generating an electromagnetic field; and

applying ~~[[it]]~~ the electromagnetic field to a portion of the human body including cartilaginous tissue, ~~wherein said step characterized by the fact that said phase~~ of generating an electromagnetic field includes the ~~phase~~ step of:

powering a solenoid with current (i(t)) having a waveform that includes the repetition of a ramp with a certain slope, said current (i(t)) causing the generation of an electromagnetic field that induces on a control probe irradiated by said electromagnetic field, a voltage (V<sub>in</sub>) of markedly constant amplitude during the period of ramp-like linear growth of said current (i(t)).

13. (currently amended) A method according to claim 12, ~~wherein-in which~~ said current (i(t)) presents an intensity and said solenoid presents a configuration such that said electromagnetic field penetrates in depth into said portion of the human body until it permeates said portion of cartilage and a portion of subchondral bone associated with said portion of cartilage over their entire thickness and in their entire extension, to activate ~~at least one of the following processes~~ at intracellular level a process selected from at least one of:

a process of articular inflammation control regarding both subchondral bone and the articular structures,

a process of articular inflammation control capable of acting in a specific manner on the adenosinic receptors A2A of the cell membrane of pro-inflammatory cells, neutrophils, doubling the number of bonds with adenosine,

a process of inhibiting the catabolic effect of inflammatory cytokines acting directly on the chondrocyte and on the cartilaginous matrix,

a process of increasing the metabolic activity of chondrocytes and the synthesis of proteoglycans,

a process of inhibiting degeneration of articular cartilage, preserving the integrity of the same articular cartilage,

a process of rapid healing of subchondral bone tissue,

a process of healing bone marrow edema regarding the subchondral bone of femoral condyles, and

a process of healing and integration of bone grafts after ligament reconstruction operations on the fibrous flexor sheaths of the knee.

14. (currently amended) A method according to claim 12, ~~wherein-in-which~~ said current presents an intensity and said solenoid presents a configuration such that said electromagnetic field penetrates in depth into said portion of the human body until it permeates said portion of cartilage and a portion of subchondral bone associated with said portion of cartilage over their entire thickness and in their entire extension, to activate, in the presence of an osteo-cartilaginous graft, a preservation process for the viability of said portion of cartilage and trigger an effect selected from at least one of ~~the following effects~~:

inhibition of reabsorption phenomena on the underlying bone,

rapid anchorage of graft,

good osteointegration of graft, and

inhibition of the formation of bone cysts.

15. (currently amended) A method according to claim 12, ~~wherein-in-which~~ said solenoid is made from a plurality ~~number~~ of sheets of a flexible material to be adapted ~~adapt~~ itself to the shape of said portion of the human body.